

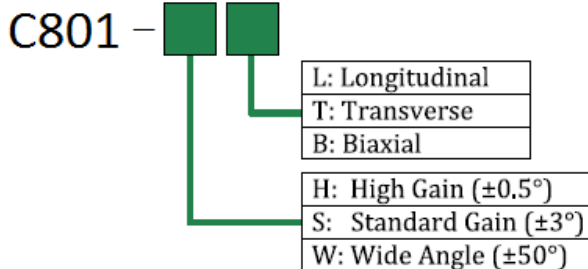
The model C801 "Tuff Tilt 420" delivers the same precision and durability of our A801, but with 4-20mA output. Units are available in single axis (uniaxial), and dual axis (biaxial) tilt configurations. The Tuff Tilt 420 is current loop powered, so tilt measurements are made using an economical 2-wire pair, and because output is 4-20mA there is no signal loss over long cables. Units also include an on-board thermistor for temperature measurements. All units are rated IP65 waterproof for advanced protection from the elements. Use the C801 for structural monitoring, 4-20mA PLC systems, industrial measurement and control, or anywhere long cable runs are necessary.



	High-Gain	Standard	Wide-Angle
Angular Range	±0.5°	±3.0°	±50°
Resolution	<0.0001°	0.0006°	0.01°
Repeatability	<0.0002°	0.001°	0.02°
Non-Linearity	1%	2%	0.5%
Scale Factor	0.0625°/mA	0.375°/mA	6.25°/mA
Kz Temp Coefficient (deg/C)	±0.0002°/°C (typical)		±0.002°/°C (typical)
Ks Temp Coefficient (%/°C)	<0.04%/°C (typical)		<0.1%/°C (typical)
Time Constant	0.15 sec		
Output	4-20mA Two-wire current loop (per axis)		
Channels	Tilt, Temperature		
Load Impedance	270 ohms		
Temperature Output	0.1°C/mV typical (single ended; 0°C = 0mV)		
Power	(0.02 Ampere x R + 10 VDC) < Vs < 29 VDC		
Environmental	-40 to +85°C operation and storage. IP65		
Dimensions	120 x 80 x 60 mm, 0.5 kg (1.1 lb.)		
Materials	Diecast painted aluminum,		
Cable	3m (10 ft.), 5-conductor + one overall shield, PVC jacket, tinned ends		

Specifications subject to change without notice on account of continued product development

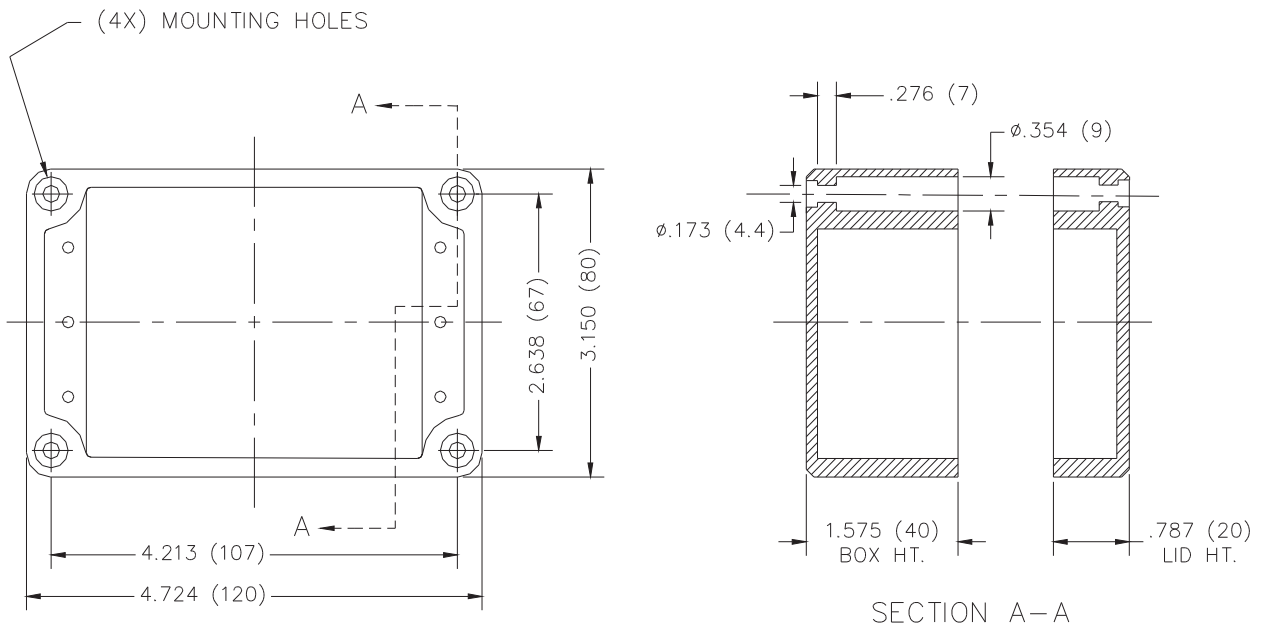
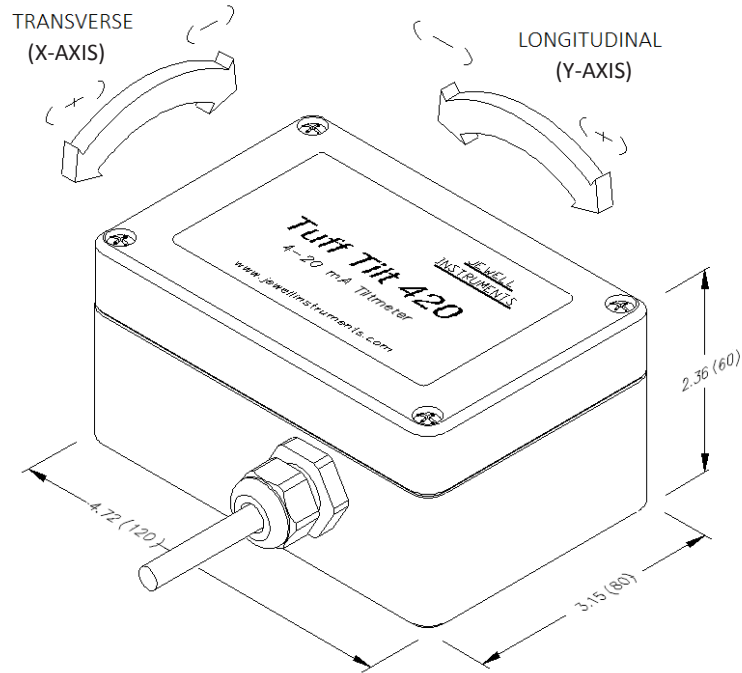
Ordering Code:



Accessories:

Part No.	Description
81439	Mounting bracket for vertical surfaces
84051	Mounting plate for horizontal surfaces
70369	6-conductor cable (specify total length on order)
62204	Optional 6-pin male receptacle (installed on tiltmeter cable)
62202	Optional 6-socket in-line plug (mates to P/N 62204 connector)

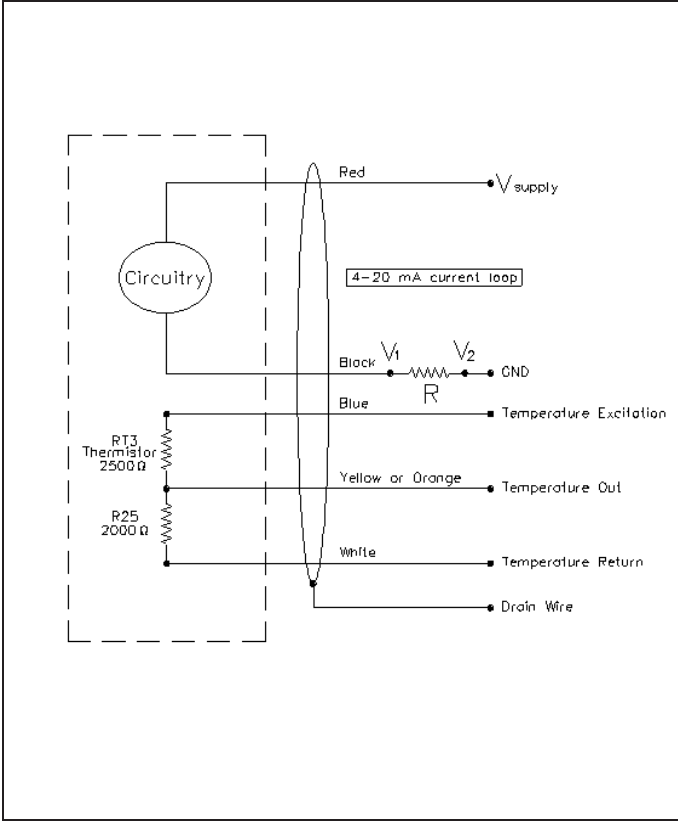
Dimensions:



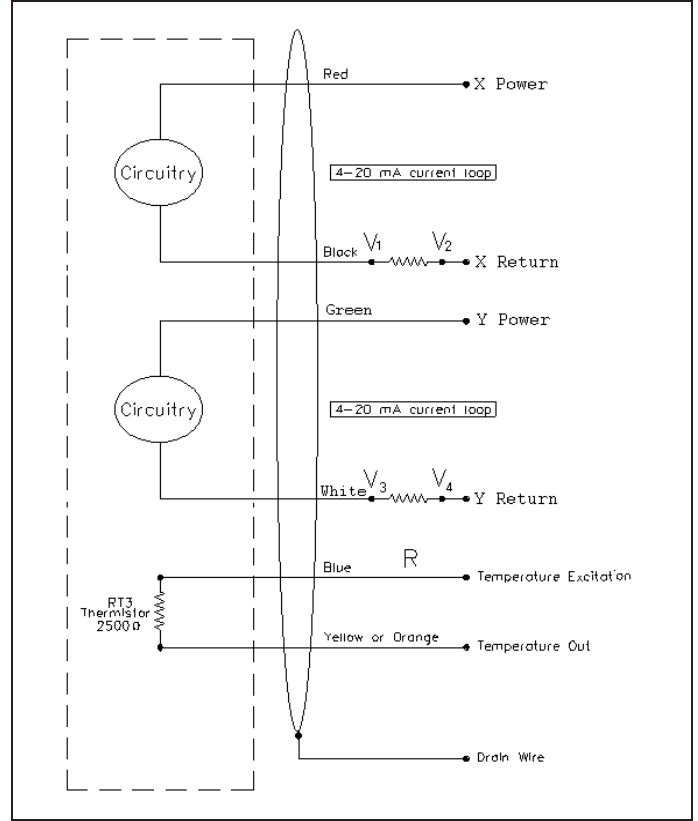
Dimensions in inches (mm)

Circuit Diagram:

Model C801 (Uniaxial Versions)



Model C801 (Biaxial Versions)



Wiring Diagram:

Function	Wire Color (Uniaxial Versions)	Wire Color (Biaxial Versions)
Loop Power (V+)	Red	Red (X), Green (Y)
Loop Return (GND)	Black	Black (X), White (Y)
Temp. Excitation	Blue	Blue
Temp. Out	Yellow	Yellow
Temp. Return	White	Not Connected
Drain	Bare (Clear)	Bare (Clear)

Model A801 “Tuff Tilt” Analog Tiltmeter

The model 801 “Tuff Tilt” Analog Tiltmeter combines high precision and durability in an economical instrument package. Using an absolute gravity referenced electrolytic sensor, the A801 delivers superior measurement accuracy with virtually no long-term drift, and high-gain units are sensitive to <math><0.0017\text{ mm/m}</math> or better. Output is a stable $\pm 5\text{ VDC}$ (±10 VDC differential), which can be read with any VDC input datalogger. All units are rated IP65 waterproof for advanced protection from the elements. Use the A801 “Tuff Tilt” for structural monitoring, angle measurement and control, platform leveling, and more.

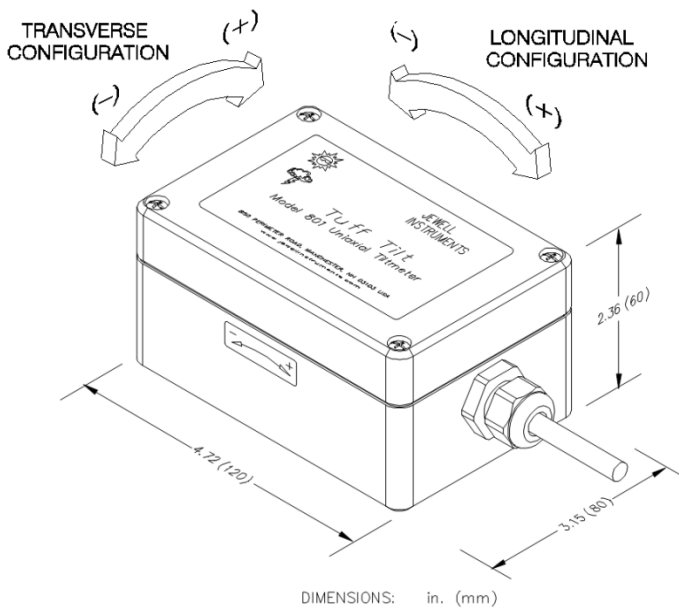
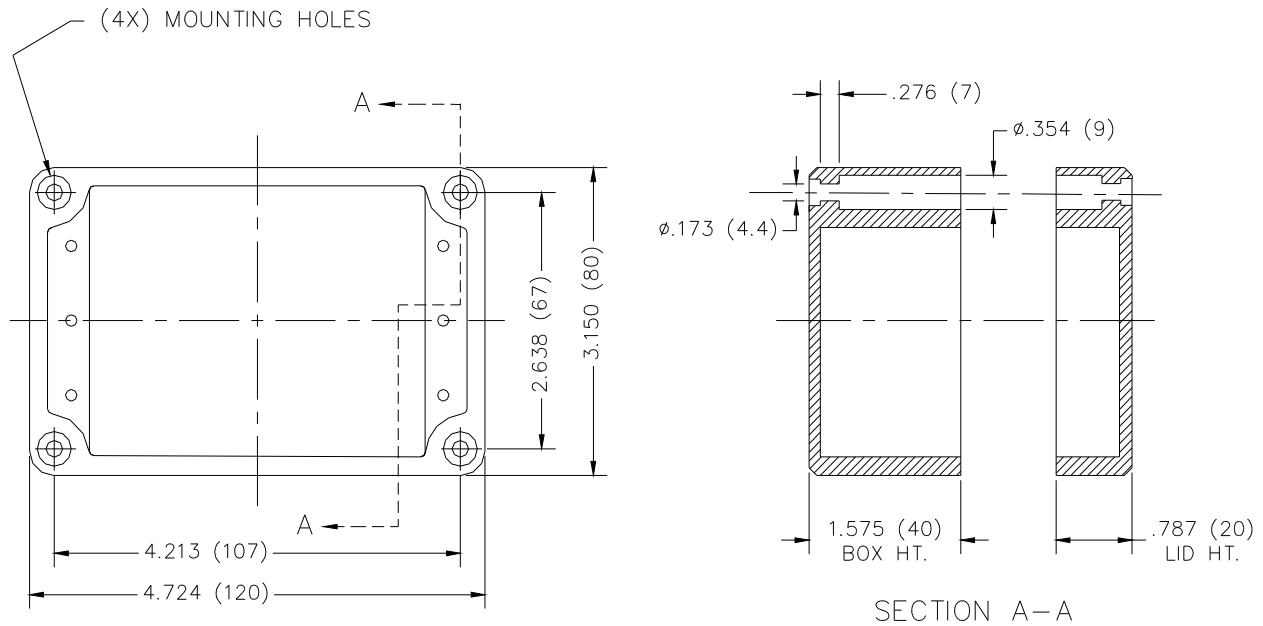


	High-Gain	Standard	Wide-Angle
Angular Range	$\pm 0.5^\circ$	$\pm 3.0^\circ$	$\pm 50^\circ$
Resolution	$<0.0001^\circ$	0.0006°	0.01°
Repeatability	$<0.0002^\circ$	0.001°	0.02°
Non-Linearity	1%	2%	0.5%
Scale Factor	$0.1^\circ/\text{V}$	$0.6^\circ/\text{V}$	$10^\circ/\text{V}$
Time Constant	1.75 sec (2-pole Butterworth low-pass filter)		0.15 sec
Kz Temp Coefficient ($^\circ/\text{C}$)	$\pm 0.0002^\circ/\text{C}$ (typical)		
Ks Temp Coefficient ($\%/^\circ\text{C}$)	0.02%/°C (typical)		
Output	$\pm 5\text{VDC}$ (single ended); $\pm 10\text{VDC}$ (differential)		
Channels	Tilt, Temperature		
Output Impedance	270 ohms		
Temperature Output	$0.1^\circ\text{C}/\text{mV}$ typical (single ended; $0^\circ\text{C} = 0\text{mV}$)		
Power	8-18 VDC @ 8mA, 250 mV ripple max, reverse polarity protected		
Environmental	-25 to +70 operation; -30 to +100 C storage. IP65		
Dimensions	120 x 80 x 60 mm, 0.6 kg (1.5 lb.)		
Materials	Diecast painted aluminum,		
Cable	3m (10 ft) 6 conductor + one overall shield, PVC jacket, tined ends		

Specifications subject to change without notice on account of continued product development

Model A801 "Tuff Tilt" Analog Tiltmeter

Model A801 "Tuff Tilt" Enclosure and Mounting Hole Dimensions



Accessories:

Part No.	Description
81439	Mounting bracket for vertical surfaces
84051	Mounting plate for horizontal surfaces
70369	Power/signal cable, 6-conductor (specify total length on order)
62204	Optional 6-pin male receptacle (installed on tiltmeter cable)
62202	Optional 6-socket in-line plug (mates to P/N 62204 connector)
870/DMM	Optional 870 Readout Module with Digital Multimeter Display

Model A801 “Tuff Tilt” Analog Tiltmeter

Pin Outs

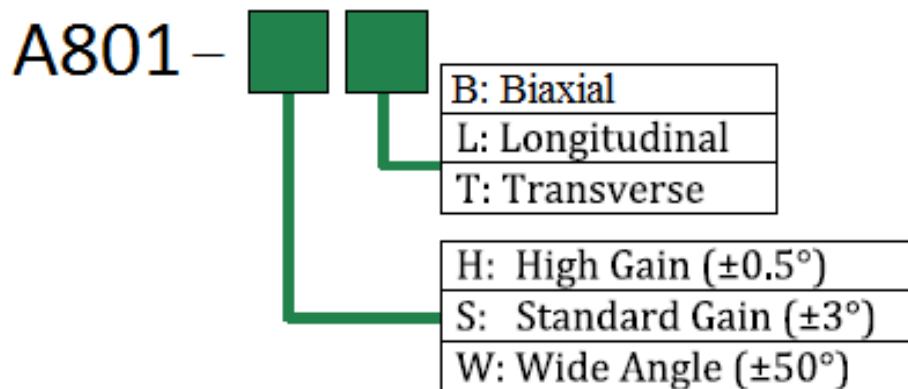
Single Axis

Color	Function
Red	+Vin
Black	Power Ground
White	Signal Ground
Green	+X
Blue	-X
Yellow	Temperature

Biaxial

Color	Function
Red	+Vin
Black	Power Ground
White	Signal Ground
Green	+X
Gray	-X
Yellow	Temperature
Blue	+Y
Brown	-Y

Ordering Code:



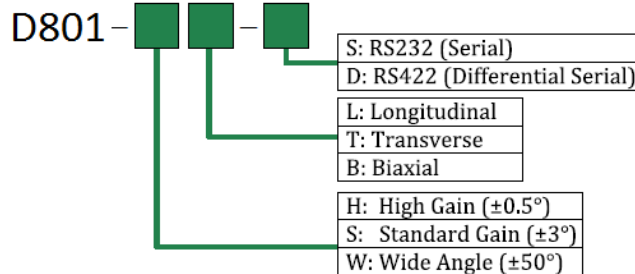
The model D801 "Tuff Tilt Digital" is a high performance, digital tiltmeter with advanced firmware features. Units use a gravity referenced electrolytic tilt sensor with superior measurement accuracy and virtually no long-term drift. Output is RS232 or RS422 (RS485 full duplex). Utilizing a 16-bit A/D, the D801 is sensitive to <math><0.0001^\circ</math> (.0017 mm/m). * User programmable firmware controls include sample averaging, auto-zero (tare), baud/output rate, and more. The D801 also includes on-board memory, with storage capacity up to 22,000 samples. All units are rated IP65 waterproof for advanced protection from the elements. Use the D801 "Tuff Tilt" for structural monitoring, platform position and control, and more.



	High-Gain	Standard	Wide-Angle
Angular Range	$\pm 0.5^\circ$	$\pm 3^\circ$	$\pm 50^\circ$
Resolution	$<0.0001^\circ$	0.0001°	0.002°
Repeatability	0.0003°	0.0003°	0.004°
Non-Linearity	0.1%	0.1%	0.1%
Kz Coefficient ($^\circ/^\circ\text{C}$)	± 0.0002 degree/ $^\circ\text{C}$ (typical)		± 0.004 degree/ $^\circ\text{C}$ (typical)
Output	RS232, RS422 (RS485 full duplex)		
Output Format	NMEA XDR, Trimble TCM, Ashtec compatible, Simple (default: X, Y, Temp., S/N)		
Baud Rate	9600 (default), 19200, 28800, 57600, 115200, 230400		
Channels	X-tilt, Y-tilt, Temperature, Serial No.		
Time Constant	0.15 sec		
Power	7-28 VDC @ 30mA, 250 mV ripple max, reverse polarity protected		
Environmental	-40 to +85 C operation and storage; IP65		
Dimensions	120 x 80 x 60 mm, 0.6kg (1.5 lbs)		
Materials	Diecast painted aluminum		
Cable	3m (10 ft.), 6 conductors + one overall shield, PVC jacket. DB9 connector for digital I/O.		

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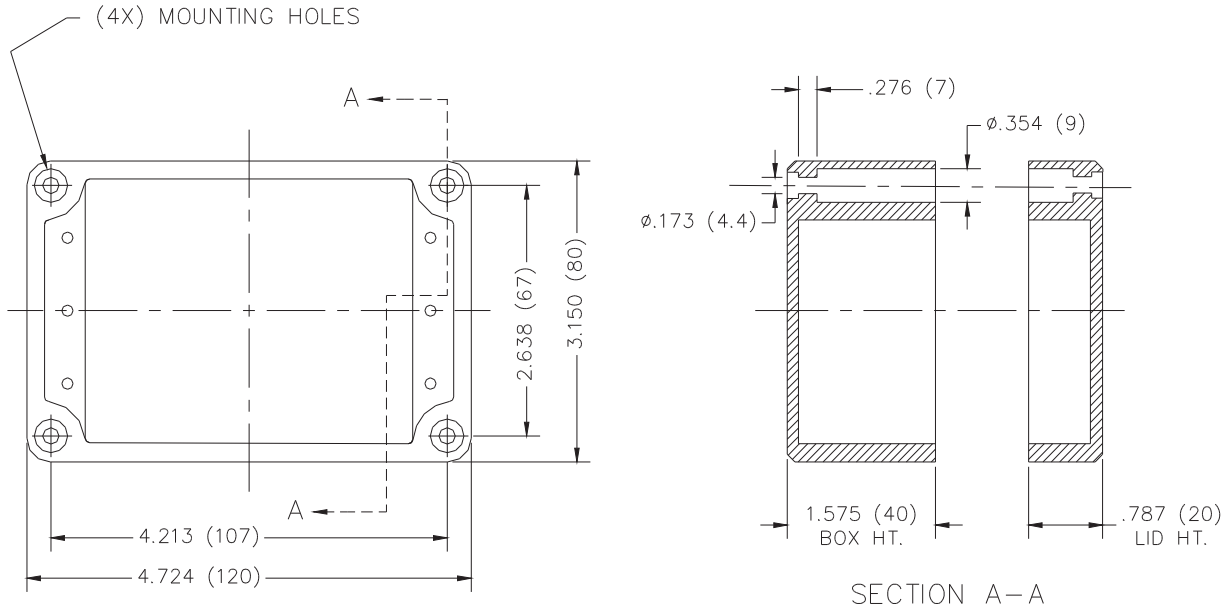
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Accessories:

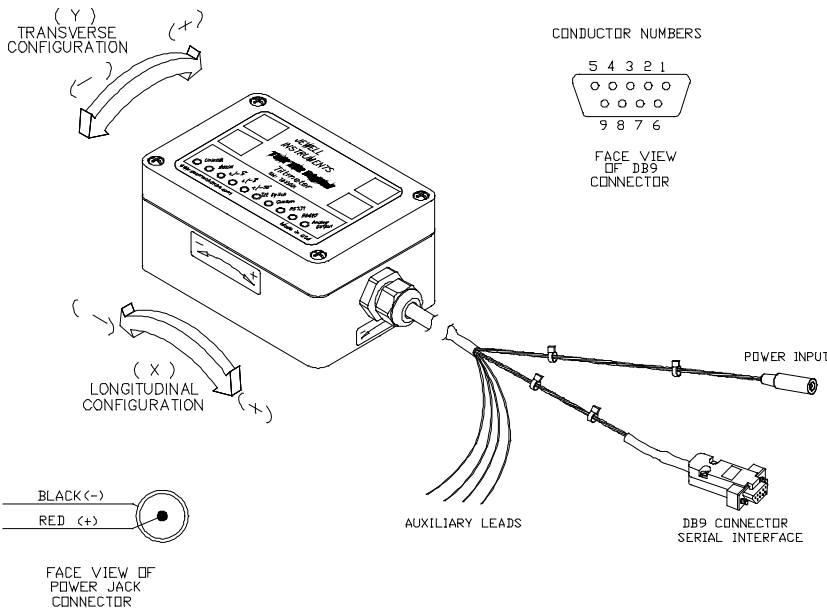
Part No.	Description
70369	6-conductor cable (specify total length on order)
00254-02	Extra power transformer (100-240VAC to 12VDC)
81439	Mounting bracket for vertical surfaces
84051	Mounting plate for horizontal surfaces

Enclosure Dimensions



Dimensions in inches (mm)

Cable Wiring and Pin-outs



RS232 Wiring

Wire Color	Function	DB9 Pin-out
Black	GND	5
Red	V+ (Power)	--
Green	Analog X Out	--
Yellow	RxD (RS232)	3
White	TxD (RS232)	2
Blue	Analog Y Out	--

RS422 Wiring

Wire Color	Function	DB9 Pin-out
Black	GND	1
Red	V+ (Power)	--
Yellow	Rx- (RS422)	9
Blue	Rx+ (RS422)	8
Green	Tx+ (RS422)	4
White	Tx- (RS422)	5